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09/877,312	06/08/2001	Christophe Serbutoviez	PHN 16, 199B	9784

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EXAMINER	
HON, SOW FUN	

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/877,312
Filing Date: June 08, 2001
Appellant(s): SERBUTOVIEZ ET AL.

Yan Glickberg
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 4, 2005.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal.

JP 05019240 (JPO website Machine English Translation) Masayuki 01-1993

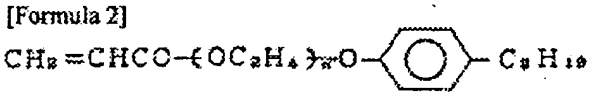
(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 5, 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masayuki.

Regarding claims 5, 9, Masayuki has a liquid crystal display which comprises a polymer-dispersed liquid crystal (PDLC) cell. The cell is manufactured from a mixture (section [0013]), which predominantly comprises a liquid crystalline material (75 % by weight) (section [0015]), a small amount of photoinitiator (photopolymerization initiator)(section [0016]) as well as two types of compounds, an ethoxylated acrylate monomer (nonyl-phenol EO acrylate which structure is shown in Formula 2 below) and an acrylate oligomer (section [0016]).

[Formula 2]



(n=3 ~ 9)

The mixture was heated to 100 degrees C (section [0016]), which means that the compounds are non-volatile at room temperature. The radical polymerization of the monomer and the oligomer (section [0013) means that the compounds are reactive.

The mixture is sandwiched between two substrates (enclosed in a cell) and polymerized under the influence of radiation (controlled by optical irradiation intensity)(section [0013]). The substrates (cell) are provided with an electrode layer (section [0016]).

Masayuki teaches that the liquid crystal display device comprises a polymer-dispersed liquid crystal cell with a TFT or MIM element (section [0021]) which means

that there is a matrix of individually drivable rows and columns of electrodes which is required for the individual pixels of the display as well as a means for driving these electrodes.

Masayuki teaches that the ethoxylated acrylate monomer is poorly miscible (weak interaction) with the liquid crystal and mixed (used together) with the acrylate (acrylic ester) oligomer taught to be miscible (of good compatibility) with the liquid crystal (section [0013]). An oligomer is a coupling of several identical monomers and thus qualifies as a homolog of the monomer.

Masayuki teaches that the advantage of the mixture of acrylates, one readily miscible (of good compatibility) and one poorly miscible (weak interaction) with the liquid crystal is that it allows for good control of phase separation structure of the polymer dispersed liquid crystal (PDLC) (section [0013]). Therefore a mixture of an ethoxylated acrylate monomer, which is instead readily miscible with the liquid crystal, coupled with an acrylate monomer, which is instead poorly miscible with the liquid crystal, is the result of routine experimentation by one of ordinary skill in the art at the time the invention was made, within the realm of the invention of Masayuki, because it follows the same principle of a miscible/immiscible acrylate mixture which results in good control of the phase separation structure of the polymer dispersed liquid crystal.

Regarding claim 7, Masayuki teaches that the quantity of each of the two types of monomers is 50 % calculated with respect to the overall quantity of both types of monomers (12 wt % nonyl phenol EO acrylate and 12 wt % acrylate (acrylic oligomer) (section [0015]), which is within the claimed range of at least 20 %.

Regarding claim 8, Masayuki teaches that the cell is manufactured from a mixture (section [0013]), which predominantly comprises a liquid crystalline material (75 % by weight) (section [0015]), encompassed by the claimed range of 70-90% by weight.

(10) Response to Argument

Arguments Concerning Claims 5 and 9:

(i) Appellant argues that Masayuki teaches the opposite of Appellant's claims, and therefore teaches away from Appellant's claims, because one skilled in the art having knowledge of Masayuki would be drawn away from using an ethoxylated acrylate monomer as a monomer readily miscible with a liquid crystalline material, lacking any expectation of success to use ethoxylated acrylate monomers as readily miscible monomers or to perform routine experimentation as the Office suggests.

Appellant is respectfully reminded that Masayuki teaches that the advantage of the mixture of acrylates, one readily miscible (of good compatibility) and one poorly miscible (weak interaction) with the liquid crystal is that it allows for good control of phase separation structure of the polymer dispersed liquid crystal (PDLC) (section [0013]). Therefore a mixture of an ethoxylated acrylate monomer, which is instead readily miscible with the liquid crystal, coupled with an acrylate monomer, which is instead poorly miscible with the liquid crystal, is the result of routine experimentation by one of ordinary skill in the art at the time the invention was made, within the realm of the invention of Masayuki, because it follows the same principle of a miscible/immiscible acrylate mixture which results in good control of the phase separation structure of the polymer dispersed liquid crystal. The use of a liquid crystal which is instead readily

miscible with the ethoxylated acrylate monomer and poorly miscible with the other acrylate monomer, is not outside the realm of the invention of Masayuki, because the principle of a miscible/immiscible acrylate mixture which results in good control of the phase separation structure of the polymer dispersed liquid crystal, is still the same.

(ii) Appellant argues that the relationship between a miscible/immiscible acrylate mixture and control of phase separation does not place use of an ethoxylated acrylate monomer (with good miscibility) within the scope of routine experimentation, while the fact that a miscible and immiscible mixture of monomers may give good control of phase separation does not provide any motivation to specifically use an ethoxylated acrylate monomer with good miscibility in a PDLC cell, since whether it is obvious to try various acrylate monomers to find an ethoxylated acrylate monomer with good miscibility is not the standard for determining obviousness.

Appellant is respectfully apprised that when the ethoxylated acrylate monomer/other monomer mixture, wherein the ethoxylated acrylate monomer is immiscible with the other monomer, remains the same, then changing the liquid crystal in order to obtain an improvement in other optical properties, is within the scope of routine experimentation. The liquid crystal may not have the same miscibility properties as the liquid crystal in the example of Masayuki (MJ90657 by Merck), but can be made to have the same miscibility properties of the ethoxylated acrylate of Masayuki, in order to take advantage of the principle of using a miscible monomer/immiscible monomer mixture wherein the ratio of miscible monomer/immiscible monomer can be varied in order to provide the desired phase separation of the liquid crystal upon polymerization

of the monomers to form the matrix. Masayuki teaches that having control of phase separation in a PDLC means having control of the structure of the PDLC (section [0013]).

(iii) Appellant argues that the fact that a miscible and immiscible mixture of monomers may give good control of phase separation does not teach or suggest that any particular ethoxylated monomer may even have good miscibility with liquid crystalline material since there are endless variations of ethoxylated acrylate monomers, based on structure and moles of ethoxylation.

Appellant is respectfully reminded that the ethoxylated acrylate used by Masayuki is a species of the ethoxylated acrylate genus recited by Appellant in independent claims 5, 9. Furthermore, Appellant states that the same ethoxylated acrylate used by Masayuki, is used by Appellant (Appeal Brief dated April 4, 2005, page 5). With the same ethoxylated acrylate of Masayuki, there is no experimentation involved in the selection of ethoxylated acrylate.

(iv) Appellant argues that the experimentation which would be required to find an ethoxylated acrylate monomer that has good miscibility would be undue particularly since the only prior art that discloses ethoxylated acrylate monomers teaches such a monomer as having poor miscibility with a liquid crystalline material.

Appellant is again respectfully reminded that with the same ethoxylated acrylate of Masayuki, there is no experimentation involved in the selection of ethoxylated acrylate.

(v) Appellant argues that the Office has not provided any reference that teaches or suggests that ethoxylated acrylate monomers of good miscibility with a liquid crystalline material, were known in the art at the time of the invention.

Appellant is respectfully reminded that the ethoxylated acrylate of Masayuki is already known. Miscibility is known to occur when materials with the same functional groups are mixed together. Therefore one of ordinary skill in the art would have had a reasonable expectation of success in finding an ethoxylated acrylate liquid crystalline material to be miscible with the ethoxylated acrylate of Masayuki, and correspondingly immiscible with the monomer with which the ethoxylated acrylate of Masayuki is immiscible.

(vi) Appellant argues that it is not clear how the use of an ethoxylated acrylate monomer with good miscibility in a miscible/immiscible mixture could be deduced by routine experimentation since the search for the right combination of a liquid crystalline material and a monomer mixture in which an ethoxylated acrylate has good miscibility with the liquid crystalline material is akin to a search for a needle in a haystack.

Again, Appellant is respectfully reminded that the ethoxylated acrylate of Masayuki is already known. Materials with the same type of functional groups are notoriously well known to have similar miscibility behavior. Therefore a reasonable expectation of success is present in terms of miscibility wherein an ethoxylated acrylate liquid crystalline material is miscible with the ethoxylated acrylate of Masayuki, and immiscible with the monomer with which the ethoxylated acrylate of Masayuki is immiscible, which is well within the realm of routine experimentation.

Conclusions:

(i) Appellant concludes that one skilled in the art would not have any desire, motivation or incentive to use an ethoxylated acrylate as a component of a PDLC mixture with a liquid matrix since Masayuki specifically teaches an ethoxylated acrylate that has poor miscibility with a liquid matrix of a PDLC cell.

Appellant is respectfully apprised that when the ethoxylated acrylate monomer/other monomer mixture, wherein the ethoxylated acrylate monomer is immiscible with the other monomer, remains the same, then changing the liquid crystal in order to obtain an improvement in other optical properties, is within the scope of routine experimentation. The liquid crystal may not have the same miscibility properties as the liquid crystal in the example of Masayuki (MJ90657 by Merck) but can be made to have the same miscibility properties of the ethoxylated acrylate of Masayuki, in order to take advantage of the principle of using a miscible monomer/immiscible monomer mixture wherein the ratio of miscible monomer/immiscible monomer can be varied in order to provide the desired phase separation of the liquid crystal upon polymerization of the monomers to form the matrix.

(ii) Appellant concludes that one skilled in the art would only find undue experimentation, akin to searching for a needle in a haystack, in attempting to discover an ethoxylated acrylate of a monomer mixture of good miscibility with the liquid crystalline material, since there is no evidence that it was even possible for an ethoxylated acrylate to have good miscibility with a liquid crystalline material.

Appellant is respectfully reminded that Appellant has acknowledged using the ethoxylated acrylate of Masayuki. Materials with the same type of functional groups are notoriously well known to have similar miscibility behavior. Therefore one of ordinary skill in the art would have had a reasonable expectation of success in finding an ethoxylated acrylate liquid crystalline material to be miscible with the ethoxylated acrylate of Masayuki, and immiscible with the monomer with which the ethoxylated acrylate of Masayuki is immiscible, which well within the realm of routine experimentation.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Sow-Fun Hon.

Sow-Fun Hon

June 21st, 2005

HAROLD PYON
SUPERVISORY PATENT EXAMINER
1772

6/23/05

Conferees:

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